

Brain Activation Patterns during Visual Scene Encoding and Recognition fMRI Tasks in Early Phase Psychosis

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Schizophrenia is a chronic and disabling illness that is associated with significant impairments in areas such as independent living, social functioning, and vocational functioning. Cognitive dysfunction is a core facet of schizophrenia with deficits occurring in areas of abstraction, attention, language, and memory. Episodic memory (EM) is a cognitive domain that has been shown to be impaired in schizophrenia. EM combines event-specific autobiographical experiences and information regarding the context in which events took place. Patients with schizophrenia may exhibit broad impairments in EM, with deficits occurring during encoding and retrieval with both visual and verbal tasks. There are a number of inconsistencies in the EM fMRI literature and indicating a need for first episode psychosis (FEP) versus chronic phase schizophrenia research. FEP have fewer and less severe medical comorbidities, shorter durations of antipsychotic treatment exposure, and lower severity of illness, all of which can impact data interpretation. In this study, brain activation patterns were assessed during performance of visual scene encoding and recognition fMRI tasks in FEP patients and healthy control subjects. It is hypothesized that FEP patients would demonstrate decreased activation during encoding and recognition in the main areas that mediate EM function, namely the hippocampus, prefrontal, and parietal cortices. Within the FEP group correlations can be determined by comparing brain activation patterns with cognition (Brief Assessment of Cognition in Schizophrenia [BACS]) and symptom (Positive and Negative Syndrome Scale [PANSS]) outcome measures. Results indicate that during the encoding task FEP exhibited significantly lower activation in the hippocampus and fusiform gyrus when compared to controls. During the recognition task FEP showed a significantly weaker cortical response in the posterior cingulate cortex, the precuneus, and the left middle temporal cortex when compared to controls. These results demonstrate a pattern of alteration in hippocampal, parietal, and temporal activity during EM processes in FEP. Altered hippocampal response in FEP may reflect dysfunctional binding mechanisms and less efficient encoding.

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